Claims

1. A circuit board (5) consisting of at least two individual circuit board layers (10) made of plastics and produced by formation technique, which each have first and second functional sides and at least one microstructured positioning formation (16) on the first and second functional sides and at least one microstructured conductor trench (12) on one of the functional sides, the conductor trench (12) being provided with a metallization (18).

2. The circuit board according to claim 1, characterized in that the positioning formation (16) is a protrusion.

3. The circuit board according to claim 2, characterized in that the protrusion (16) is in the shape of a pyramid.

4. The circuit board according to claim 1, characterized in that the positioning formation (16) is a depression.

5. The circuit board according to claim 4, characterized in that the depression (16) is complementary to a pyramid-shaped protrusion.

6. The circuit board according to claim 2 and claim 4, characterized in that each individual layer is provided on one functional side with a plurality of protrusions (16) and on the other functional side with a plurality of depressions (16), the protrusions of the one individual layer engaging into the depressions of the other individual layer, so that the two individual layers are precisely positioned in relation to each other.

7. The circuit board according to claim 1, characterized in that the positioning formation is an opening (16) which extends from the one functional side through the individual layer (10) and as far as to the other functional side.

8. The circuit board according to claim 7, characterized in that a positioning pin (38) is provided which extends through the openings (16) in the individual layers, so that the two individual layer are precisely positioned in relation to each other.

9. The circuit board according to any of the preceding claims, characterized in that the conductor trench (12) extends as far as to the edge of the circuit board, so that a plug connector may be connected.

10. The circuit board according to any of the preceding claims, characterized in that the conductor trench (12) is semicircular in cross-section.

11. The circuit board according to any of claims 1 to 9, characterized in that the conductor trench (12) is rectangular in cross-section.

12. The circuit board according to either of claims 10 and 11, characterized in that a first conductor trench (12) is provided on one of the individual layers (10) and a second conductor trench (12) is provided on the other individual layer (10) and that the two conductor trenches are located centered opposite each other, one of the conductor trenches having smaller dimensions than the other conductor trench.

13. The circuit board according to claim 12, characterized in that the two conductor trenches (12) extend as far as to the edge of the circuit board (5) and a plug-in connection for an RF line is provided.

14. The circuit board according to either of claims 12 and 13, characterized in that the space between the conductor trenches (12) located opposite each other is filled with air.

15. The circuit board according to any of the preceding claims, characterized in that a cooling groove (20) is provided on at least one of the individual layers, the cooling groove being filled with a metallization (18) of a thickness such that a heat sink is formed.

16. The circuit board according to any of the preceding claims, characterized in that a cooling channel (34) is provided on at least one of the individual layers, the cooling channel being adapted for a cooling agent (36) to be conducted therethrough, and that the other individual layer covers the cooling channel.

17. The circuit board according to claim 16, characterized in that the cooling channel extends as far as to the edge of the circuit board (5) and a connection for the cooling agent is formed.

18. The circuit board according to any of the preceding claims, characterized in that at least one mount (26) for an electronic, optical or optoelectronic component (28) is provided in at least one of the individual layers.

19. The circuit board according to claim 18, characterized in that a recess (32) located opposite the mount is provided in the other individual layer.

20. The circuit board according to any of the preceding claims, characterized in that the two individual layers are connected with each other by an electrically conductive material (24).

21. The circuit board according to claim 20, characterized in that a contact opening (22) is provided in at least one of the individual layers (10), the contact opening extending from the first functional side through the individual layer (10) and as far as to the second functional side thereof, and that the contact opening (22) is filled with an electrically conductive material.

22. The circuit board according to any of the preceding claims, characterized in that at least one of the individual layers consists of an optically transparent material and that on this individual layer a waveguide trench (42) is provided which is filled with an optically transparent material

the refractive index of which suitably differs from that of the material of the individual layer (10), so that a waveguide (40) is formed.

23. The circuit board according to claim 22, characterized in that the individual layer provided with the waveguide (40) comprises a mirror (44) by means of which light may be coupled into and out of the waveguide.

24. The circuit board according to claim 23, characterized in that the mirror (44) is a separate component which is inserted in the individual layer.

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25. A method of manufacturing a circuit board (5), in particular according to any of the preceding claims, comprising the following steps:

- at least two individual layers blanks (110) are produced by formation from a casting, each of the blanks being provided with positioning formation preforms (116) on first and second functional sides;
- the individual layer blanks (110) are subjected to a pretreatment on their entire surface such that they can be provided with a metallization;
- in those regions which are not intended to be provided with a metallization, the surface is subjected to a subsequent treatment, so that no metallization is deposited in these regions;
- a metallization (18) is applied to the regions which have not been subjected to a subsequent treatment;
- the individual layer blanks are placed on top of one another and at the same time precisely positioned in relation to each other by means of the positioning formations (16).

26. The method according to claim 25, characterized in that the pretreatment consists in applying a thin pre-metallization (118).

27. The method according to claim 26, characterized in that the subsequent treatment consists in mechanically removing the pre-metallization (118).

28. The method according to claim 25, characterized in that the pretreatment consists in dispersing seeds on the substrate.

29. The method according to claim 28, characterized in that the subsequent treatment consists in chemically removing the dispersed seeds.

30. The method according to any of claims 25 to 29, characterized in that the individual layers (10) are injection-molded.